

PATENT

Atty Docket No.: 200312051-1

App. Ser. No.: 10/734,174

IN THE CLAIMS

Please find below a listing of all of the pending claims. The statuses of the claims are set forth in parentheses.

1. (Withdrawn) A cooling system for an electronic system housing a heat-generating component, said cooling system comprising:

a heat sink having a length and a width, the heat sink including:

a base;

a plurality of fins attached to the base, wherein the plurality of fins are spaced apart from one another to have a relatively low height to width aspect ratio in the spacing between the plurality of fins; and

wherein the heat-generating component has a length and a width, and wherein at least one of the length and the width of the heat sink is substantially larger than at least one of an associated length and width of the heat-generating component, said heat sink being configured to dissipate heat generated by the heat-generating component.

2. (Withdrawn) The cooling system according to claim 1, wherein the aspect ratio is between approximately 6 and 9.

3. (Withdrawn) The cooling system according to claim 1, wherein the heat sink includes a first side and a second side and wherein a pressure drop from the first side to the second side of the heat sink is between approximately 0.03 and 0.09 inches of water.

4. (Withdrawn) The cooling system according to claim 1, further comprising:
one or more heat pipes extending through at least a portion of the base.

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5. (Withdrawn) The cooling system according to claim 1, wherein the base comprises a fluid channel in the form of a closed labyrinth containing a working fluid having a relatively low boiling point temperature.

6. (Withdrawn) The cooling system according to claim 1, wherein the base comprises a vapor chamber containing a working fluid having a relatively low boiling point temperature.

7. (Withdrawn) The cooling system according to claim 1, further comprising:
a heat conductive interface material for placement between the heat sink and the heat-generating component.

8. (Withdrawn) The cooling system according to claim 1, further comprising:
one or more fans configured to blow air through the plurality of fins, wherein the one or more fans comprise relatively low capacity fans.

9. (Withdrawn) The cooling system according to claim 1, further comprising a plurality of heat sinks, at least one of the plurality of heat sinks having a different configuration from at least one other heat sink of the plurality of heat sinks.

10. (Withdrawn) The cooling system according to claim 1, wherein the electronic system comprises a plurality of heat-generating components, at least one of the plurality of heat-generating components having a different height from at least one other of the plurality of heat-generating components, wherein the base comprises sections having various heights

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to substantially accommodate for the different heights of the plurality of heat-generating components.

11. (Currently Amended) An electronic system having a heat-generating component, said electronic system comprising:

a housing having a first section and a second section, wherein the first section is alternatively attachable to and detachable from the second section, wherein the first and second sections together form an exterior enclosure of the electronic system;

a mounting board supported by the second section of the housing, wherein the heat-generating component is mounted on the mounting board; and

a cooling system attached to the first section, wherein the cooling system includes having a base and a plurality of fins configured to dissipate heat generated by the heat-generating component attached to the first section, said cooling system being configured to contact the heat-generating component when the first section is attached to the second section and said cooling system being further configured to disengage from the heat-generating component when the first section is detached from the second section to allow access to the heat-generating component.

12. (Original) The system according to claim 11, wherein said housing includes a relatively open space around the heat-generating component and wherein the cooling system occupies substantially all of the relatively open space around the heat-generating component.

13. (Original) The system according to claim 11, wherein the plurality of fins are configured to have a relatively low height to width aspect ratio.

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14. (Original) The system according to claim 13, wherein the aspect ratio is between approximately 6 and 9.

15. (Original) The system according to claim 11, wherein the cooling system includes a first side and a second side and wherein a pressure drop from the first side to the second side of the cooling system is between approximately 0.03 and 0.09 inches of water.

16. (Original) The system according to claim 11, wherein the cooling system includes one or more heat pipes extending through at least a portion of the base.

17. (Original) The system according to claim 11, a heat conductive interface material placed between the base and the heat-generating component.

18. (Original) The system according to claim 11, wherein the cooling system includes one or more fans configured to blow air through the plurality of fins, wherein the one or more fans comprise relatively low capacity fans.

19. (Original) The system according to claim 11, wherein the cooling system comprises a plurality of heat sinks, at least one of the plurality of heat sinks having a different configuration from at least one other heat sink of the plurality of heat sinks.

20. (Currently Amended) An electronic system having a heat-generating component, said electronic system comprising:

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a housing having a first section and a second section, wherein the first section is alternatively attachable to and detachable from the second section, wherein the first and second sections together form an exterior enclosure of the electronic system;

a mounting board supported by the second section of the housing; and

a cooling system attached to the first section, wherein the cooling system includes a base and a plurality of fins configured to dissipate heat generated by the heat-generating component attached to the first section, said heat-generating component being thermally attached to the cooling system, wherein the heat-generating component is configured to become positioned in the electronic system engage the mounting board when the first section is attached to the second section and wherein the heat generating component is further configured to disengage from the mounting board when the first section is detached from the second section.

21. (Canceled)

22. (Currently Amended) The system according to claim 20[[1]], wherein the heat-generating component comprises engaging elements for engaging the mounting board.

23. (Original) The system according to claim 22, wherein the first section comprises a first mating device and the second section comprises a second mating device, wherein the first mating device is configured to engage the second mating device when the first section is attached to the second section, and wherein the engagement between the first mating device and the second mating device is configured to substantially protect the engaging elements of the heat-generating component.

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24. (Original) The system according to claim 20, wherein said housing includes a relatively open space around the heat-generating component and wherein the cooling system occupies substantially all of the relatively open space around the heat-generating component.

25. (Original) The system according to claim 20, wherein the cooling system comprises a base and a plurality of fins configured to dissipate heat generated by the heat-generating component, said plurality of fins being configured to have a relatively low height to width aspect ratio.

26. (Original) The system according to claim 25, wherein the aspect ratio is between approximately 6 and 9.

27. (Original) The system according to claim 25, wherein the cooling system includes a first side and a second side and wherein a pressure drop from the first side to the second side of the cooling system is between approximately 0.03 and 0.09 inches of water.

28. (Original) The system according to claim 25, wherein the cooling system includes one or more heat pipes extending through at least a portion of the base.

29. (Original) The system according to claim 25, a heat conductive interface material placed between the base and the heat-generating component.

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30. (Original) The system according to claim 20, wherein the cooling system includes one or more fans configured to blow air through the plurality of fins, wherein the one or more fans comprise relatively low capacity fans.

31. (Original) The system according to claim 20, wherein the cooling system comprises a plurality of heat sinks, at least one of the plurality of heat sinks having a different configuration from at least one other heat sink of the plurality of heat sinks.

32. (Withdrawn) A method of dissipating heat generated by a heat-generating component in an electronic system having available space, said method comprising:

thermally contacting a cooling system that occupies a substantial portion of the available space in the electronic system to the heat-generating component, said cooling system also including fins having a relatively low height to width aspect ratio;

conducting heat generated by the heat-generating component to the cooling system;

and

dissipating the heat conducted from the heat-generating component to cool the heat-generating component.

33. (Withdrawn) The method according to claim 32, wherein the electronic system includes a housing having a first section and a second section, wherein the first section is attachable to the second section, said method further comprising:

attaching the cooling system to the first section prior to the step of thermally

contacting the cooling system to the heat-generating component; and

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wherein the step of thermally contacting the cooling system to the heat-generating component comprises attaching the first section to the second section.

34. (Withdrawn) The method according to claim 32, wherein the electronic system includes a housing having a first section and a second section, wherein the first section is attachable to the second section, and wherein the second section includes a mounting board, said method further comprising:

attaching the cooling system to the first section prior to the step of thermally contacting the cooling system to the heat-generating component;

wherein the step of thermally contacting the cooling system to the heat-generating component comprises attaching the heat-generating component to the cooling system; and
engaging the heat-generating component with the mounting board during attachment of the first section to the second section.

35. (Withdrawn) A system for dissipating heat generated by a heat-generating component in an electronic system having available space, said system comprising:

means for thermally contacting a cooling system that occupies a substantial portion of the available space in the electronic system to the heat-generating component, said cooling system having fins with a relatively low height to width aspect ratio;

means for conducting heat by the heat-generating component to the cooling system;
and

means for dissipating the heat conducted from the heat-generating component, to thereby cool the heat-generating component.

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36. (Withdrawn) The system according to claim 35, wherein the electronic system includes a housing having a first section and a second section, wherein the first section is attachable to the second section, said system further comprising:

means for attaching the cooling system to the first section; and

means for engaging the first section to the second section, wherein the means for thermally contacting the cooling system to the heat-generating component is operable to contact the cooling system to the heat-generating component through engagement of the first section to the second section by the means for engaging.

37. (Withdrawn) The system according to claim 35, wherein the electronic system includes a housing having a first section and a second section, wherein the first section is attachable to the second section, and wherein the second section includes a mounting board, said system further comprising:

means for attaching the cooling system to the first section;

means for attaching the heat-generating component to the cooling system;

means for engaging the first section to the second section; and

means for engaging the heat-generating component with the mounting board through engagement of the first section to the second section by the means for engaging the first section to the second section.